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(71) Applicant
Microvol Limited
(Incorporated in the United Kingdom)
Whitehouse Road, Ipswich, Suffolk, IP1 5LU,
United Kingdom

(72) Inventor
Terence Edward Weston

(74) Agent and/or Address for Service
Kelth W Nash & Co
Pearl Assurance House, 90-92 Regent Street,
Cambridge, CB2 1DP, United Kingdom

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(56) Documents cited
GB 2134078 A GB 2129551 A GB 2120786 A

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UK CL (Edition J) G1B BCN, G4H HJ
INT CL⁴ G01N

(54) Dispenser for chemical analysis carrying a code

(57) A dispenser 10 for chemical analysis insertable into e.g. a cylindrical housing 20 of an analyser 18, carries a label 16 bearing an optical code of analysis data e.g. in bar coded form. A scanning head 28 can be mounted towards the top of the housing 20, so that as the dispenser is lowered into the analyser the head 28 reads the bar code. This data may then be fed to a microprocessor for the automatic setting of the analyser. The dispenser 10 may have a longitudinal groove with which a pin 26 at the top of the housing 20 engages to align the bar code label 16 with the scanning head 28.

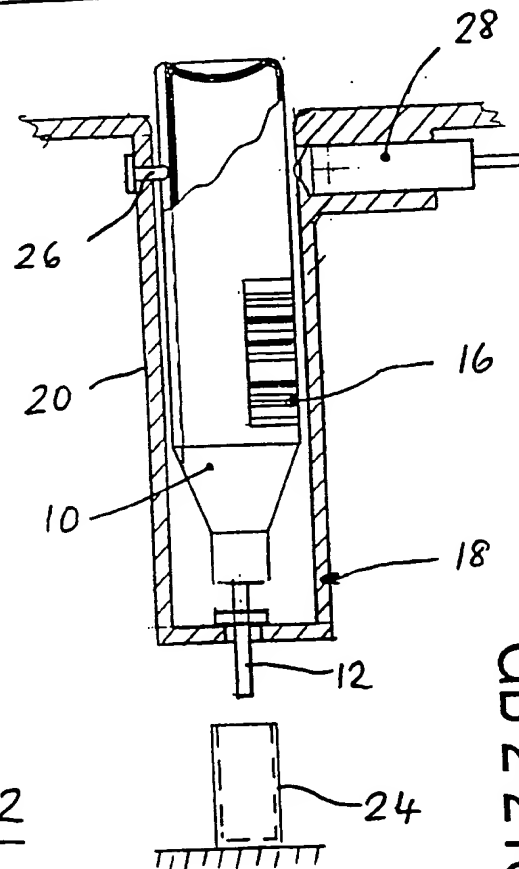


FIG. 2

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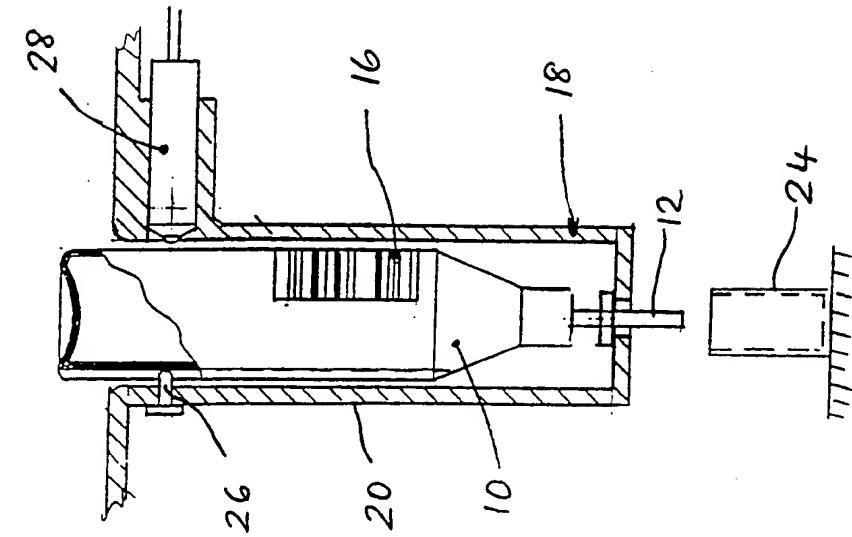


FIG. 2

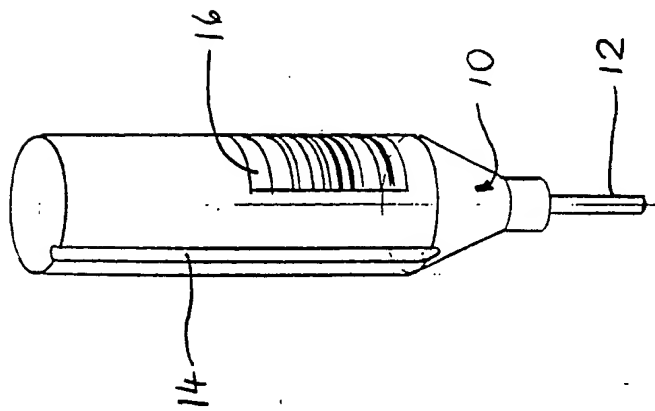


FIG. 1

Title: Improvements relating to chemical analysis

The present invention relates to a chemical analysis, and more particularly to a method and apparatus for wet-chemistry analysis.

Background to the invention

In wet-chemistry analysers, such as used in medical diagnosis, it is invariably necessary for the instrument to be set up to recognise the presence of a sample, to control the reaction of the sample/reagent mixture, to measure a property of the reacted sample, and then to display the result. In all but the most simple analysers, which are limited in performance and flexibility, it is frequently necessary to change the settings of the instrument to test for different substances. Typically this is achieved for example by manually setting an aperture, selecting an optical filter, adjusting the incubation temperature, and monitoring the reaction time before measurement. This procedure is slow, inconvenient, and prone to error.

More advanced instruments allow for the settings to be selected via a keyboard, and it is normal for the operator to refer to a printed process sheet to obtain the data required for the analysis. In addition to the instrument settings, it is also necessary for the operator to enter at least the sample identity and date. Thus the total amount of data to be entered is so great that errors are

inevitable if large numbers of samples are to be analysed for a variety of substances.

Summary of the invention

According to one aspect of the present invention there is provided a method of performing chemical analysis in which a dispenser containing a sample is inserted into an analyser for analysis of the sample, wherein the dispenser carries an optical code incorporating at least part of the analysis programme, said code being optically scanned by the analyser on insertion thereof.

The optical code is preferably a bar code, and may carry information relating, for example, to the incubation time and temperature of the sample.

The invention also extends to apparatus for performing chemical analysis including a dispenser for containing a sample to be analysed, an analyser into which the dispenser is inserted, the dispenser carrying an optical code which incorporates at least part of the analysis programme, and scanning means in the analyser for optically scanning said code on insertion thereof.

Preferably the optical code is a bar code, and may carry, for example, information relating to the incubation time and temperature of the sample, as well as information relating to the origin, shelf-life and other quality control data of the dispenser. Such parameters may then automatically be set by a microprocessor to which said scanning means is connected.

The bar code is preferably applied as a label onto one

side of the dispenser, being the side at which said scanning means is located.

To ensure alignment between the bar code and the scanning means, the dispenser and the analyser are preferably shaped so that the dispenser can only be inserted in the correct orientation. Preferably the dispenser is cylindrical in section and carries a longitudinal groove which cooperates with a pin or the like in the analyser, to ensure such correct orientation.

The invention is applicable to most types of analyser, varying from the manually operated types to the most sophisticated ones.

By providing the information in bar coding, an accurate, easy and inexpensive method of data storage and data entry is provided, which is a highly effective alternative to keyboard data entry, as the code can be scanned much faster and more accurately than key entry. Bar coding also has a faster read rate than optical character readers; and when compared with magnetic strip encoding it offers significant advantages in flexibility, symbol placement and immunity to electromagnetic fields.

The invention may, for example, be utilised in the arrangements described in the specifications of international patent applications Nos. PCT/GB87/00704 and 00909.

Brief description of the drawings

How the invention may be put into effect will now be described, by way of example only, with reference to the

accompanying drawings, in which:

Figure 1 is a perspective view of a dispenser embodying the invention; and

Figure 2 is a side view in section of the dispenser of Figure 1 when placed into an analyser.

Description of embodiment

Referring first to Figure 1, there is shown a pressurised dispenser container 10 of generally cylindrical shape, and made of metal, moulded plastics, glass or ceramic material. The dispenser may be of the conventional type which meters a one-shot dose, and has discharge tube 12 extending downwardly from its bottom tapered end. Extending longitudinally down one side of the cylindrical surface of the dispenser is formed a groove 14. Mounted on the opposite side of the groove is affixed a label 16 bearing data in bar-code form.

Figure 2 shows the dispenser 10 mounted in part of an analyser 18 consisting of a cylindrical housing 20 formed at the bottom with an opening 22 through which the discharge tube 12 projects. A cuvette 24 is positioned on a horizontal surface under the tube 12.

Towards the top of the housing 20 is fixed a pin 26 which is positioned to locate in the groove 14, so that the dispenser can only be loaded into the analyser in the orientation shown.

Mounted opposite the pin 26 is a photoelectric scanning head 28, adapted to read bar codes. Thus when the

dispenser 10 is inserted into the housing 22 the pin 26 locates in the groove 14 causing the bar-coded label 16 to be directed towards the scanning head, and continued insertion allows the head 28 to scan the bar code and send a signal to a microprocessor (not shown) forming part of the analyser.

By way of example, the coded dispenser may be used in a clinical analyser, where it would identify itself, and instruct the analyser that it is to test the sample for (say) Bilirubin, within the range 0.5-1.5 mmol/l and should set the incubation temperature to 37°C, incubation time 4 minutes, and adjust the monochromator grating to measure absorbance of the reacted sample at a wavelength of 520 nanometers.

The code may also carry unique details relating to the dispenser's origin, shelf-life and similar quality control data.

It will be appreciated that in place of the groove 14 the dispenser may have a flat, or other feature that ensures that the dispenser is correctly orientated for bar-code scanning. Alternatively, the code may be applied in the form of continuous bands around the periphery of the container. As a further alternative a key may be provided on the dispenser which carries the code and which self-aligns with the scanning head. In each case the code may be in the form of a label, or printed directly onto the dispenser or key.

CLAIMS

1. A method of performing chemical analysis in which a dispenser containing a sample is inserted into an analyser for analysis of the sample, the dispenser carrying an optical code incorporating at least part of the analysis programme, and in which the analyser optically scans said code on insertion of the dispenser.
2. A method according to claim 1 in which the optical code is a bar code.
3. A method according to claim 2 in which the bar code carries information relating to the incubation time and temperature of the sample.
4. Apparatus for performing chemical analysis, comprising a dispenser for containing a sample to be analysed, an analyser into which the dispenser is inserted, the dispenser carrying an optical code which incorporates at least part of the analysis programme, and scanning means in the analyser for optically scanning said code on insertion thereof.
5. Apparatus according to claim 4 in which the optical code is a bar code.
6. Apparatus according to claim 5 in which the bar code carries information relating to the parameters of the incubation time and temperature of the sample.

7. Apparatus according to claim 6 further comprising a microprocessor to which said scanning means is connected for automatically setting said parameters.

8. Apparatus according to any one of claims 4 to 7 in which the bar code is applied as a label onto one side of the dispenser, being the side at which said scanning means is located.

9. Apparatus according to any one of claims 4 to 8 in which the dispenser and the analyser are shaped so that the dispenser can only be inserted in the correct orientation for said scanning means.

10. Apparatus according to claim 9 in which the dispenser is generally cylindrical in section and carries a longitudinal groove which cooperates with a pin or the like in the analyser, to ensure such correct orientation.

11. A method of performing chemical analysis substantially as herein described with reference to, and as shown in, the accompanying drawings.

12. Apparatus for performing chemical analysis substantially as herein described with reference to, and as shown, in the accompanying drawings.

